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# METHOD AND SYSTEM FOR USAGE-BASED PRICING OF E-CONTENT

5    BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to methods and systems for e-content distribution. In particular, the invention relates to methods and systems for e-content checkout,

10    extension, return, and usage tracking.

Description of the Related Art

Online content that is accessible through the Internet, often referred to as "e-content",

15    can take many forms, including advertising, educational information, news, online catalogs, and the like. While online advertisers and marketers provide their content for free and earn revenue from sales, some types of e-content providers are in the business of providing e-content itself and must earn their revenue from the distribution of the e-content. The later type of e-content providers typically provides

20    e-content services or products, such as e-books, e-videos, e-movies, e-television, e-games, e-software, e-documents, and the like.

One alternative to selling the "e-content" or "title" is known as "pay-per-view." In a pay-per-view system, the user does not purchase a copy of the e-content, but rather

25    purchases the right to access the e-content a single time. In this manner, the user is prevented from multiple uses or viewing of the e-content unless the user pays another access fee. The result is that consumers pay for access in proportion to the number of times the e-content is accessed.

30    One problem associated with pay-per-view systems is the inflexibility of the access and pricing structure, which is really no different than their brick-and-mortar equivalents, namely video rental stores, movie theatres, arcades, and the like. These pay-per-view type systems always provide the consumer with full access to the content, but similarly always charge the consumer for full access. While these

35    systems are simple and acceptable to many consumers, these systems do not

recognize that consumers may be interrupted after only partial access or viewing, that consumers may only be interested in a portion of the e-content, or that consumers may recognize quickly that they do not enjoy the e-content or asked for the wrong e-content.

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Accordingly, there is a need for methods and systems that provide access to e-content in a more flexible manner based on the extent of access or usage, rather than the number of access sessions. There is also a need for methods and systems that track the extent of access or usage of e-content and charge the consumer in accordance with

10 the extent of access. It would be desirable if the methods and systems allowed access to a greater variety of e-content types, such as software, that are not well suited to pay-per-view schemes. It would be further desirable if the methods and systems provided consumer incentives, such as free sampling of e-content, volume discounts, and the like.

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## SUMMARY OF THE INVENTION

The present invention provides a method for pricing access to e-content. The method comprises tracking one or more usage characteristics of an individual's access to e-

20 content, wherein the one or more usage characteristics are selected from the group consisting of the quantity of e-content accessed, the quantity of time spent accessing the e-content, the nature of the e-content, and combinations thereof. The individual is charged a price that is determined as a predetermined function of the one or more usage characteristics. Optionally, the method may further comprise establishing a

25 usage profile for the individual, storing in the usage profile the one or more usage characteristics tracked during a first session, and updating the usage profile to reflect the one or more usage characteristics tracked during a subsequent session. The step of updating the usage profile may include accumulating the one or more usage characteristics over a plurality of sessions. Preferably, the price is determined as a

30 predetermined function of the one or more usage characteristics of the current session, the one or more accumulated usage characteristics, or a combination thereof. The method may also comprise transmitting the e-content to a computer along with a usage tracker for performing the step of tracking one or more usage characteristics, and accepting return of the e-content from the computer along with the one or more

35 usage characteristics. Examples of accepting return of the e-content include receiving

the entire e-content, deleting the e-content from the individual's computer, or determining whether any copies of the transmitted e-content were made. In one embodiment, the e-content is transmitted from a server to a computer along with a usage tracker for performing the step of tracking one or more usage characteristics,

5      then the usage tracker periodically sends messages to the server indicating a change in the one or more usage characteristics.

The invention also provides a method for managing access to e-content, comprising: downloading e-content from a server to a client computing device along with an

10     embedded usage tracking program; monitoring, using the usage tracking program, one or more characteristic of the client's access to the e-content; transmitting, using the usage tracking program, a usage report including the one or more characteristics from the client to the server; determining whether the client's access to the e-content exceeds an expiration setpoint; and upon a determination of expiration, extending the

15     expiration setpoint.

A computer system for pricing access to e-content is provided, wherein the system comprises tracking means for tracking one or more usage characteristics of an individual's access to e-content, wherein the one or more usage characteristics are

20     selected from the group consisting of the quantity of e-content accessed, the quantity of time spent accessing the e-content, the nature of the e-content, and combinations thereof. The system also includes charging means for charging the individual a price that is determined as a predetermined function of the one or more usage characteristics. Optionally, the system may further comprise establishing means for

25     establishing a usage profile for the individual, storing means for storing in the usage profile the one or more usage characteristics tracked during a first session, and updating means for updating the usage profile to reflect the one or more usage characteristics tracked during a subsequent session. In one embodiment, the system also comprises transmitting means for transmitting the e-content to a computer along

30     with a usage tracker for tracking one or more usage characteristics, and accepting means for accepting return of the e-content from the computer along with the one or more usage characteristics. In another embodiment, the system will comprise transmitting means for transmitting the e-content to a computer along with a usage tracker having tracking means for tracking one or more usage characteristics, and

receiving means for receiving messages from the usage tracker indicating a change in the one or more usage characteristics.

Finally, the invention provides a computer program product including instructions
5   embodied on a computer readable medium, the instructions comprising tracking instructions for tracking one or more usage characteristics of an individual's access to e-content, wherein the one or more usage characteristics are selected from the group consisting of the quantity of e-content accessed, the quantity of time spent accessing the e-content, the nature of the e-content, and combinations thereof. The method also
10  comprises charging instructions for charging the individual a price that is determined as a predetermined function of the one or more usage characteristics.

The foregoing and other objects, features and advantages of the invention will be apparent from the following more particular description of a preferred embodiment of
15  the invention, as illustrated in the accompanying drawing wherein like reference numbers represent like parts of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

20  FIG. 1 is a structural diagram of a distributed data processing system illustrating the relationship of an e-content server with consumers or clients.

FIG. 2 illustrates a client system communicating with a server system to access e-content located on the e-content server according to the present invention.

FIG. 3 is an example of a client computer system in which the present invention may
25  be implemented.

FIG. 4 is a block diagram of one embodiment of a usage management system in accordance with the present invention.

FIG. 5 illustrates the process for monitoring subscriber related activities that lead to the generation of usage event records.

30  FIG. 6 illustrates an embodiment of an online teleprocessing gateway, in accordance with the invention, having various TCP client and server sockets.

FIG. 7 is a flowchart illustrating the operation of the online teleprocessing gateway illustrated in FIG. 6.

FIG. **8** is a flowchart of a dynamic, usage-based pricing process that would be executed by the service and billing server of FIG. **6**.

FIG. **9** is a flowchart of an e-content checkout extension process of the present invention.

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DETAILED DESCRIPTION

FIG. **1** is a structural diagram of a distributed data processing system **10** illustrating the relationship of an e-content server **11** with multiple e-content clients or consumers

10       **12** for communication over a communications system or network **13**, such as the Internet, an intranet or other network system. As illustrated, the user at the client workstation **12** can obtain access over the computer network **13** to an e-content record **15** located in a database **14** on the server **11** through the user's web browser **17**. The e-content server **11** of the present invention may be a Web Application Server

15       (WAS), a server application, or a servlet process, where the server includes e-content access policies **16** and an e-content accounting database **18** containing instructions for handling e-content. The e-content server **11** is also in communication with a database of titles for a variety of e-content applications, such as e-books, e-music and e-video. The web server **11** preferably generates a graphical user interface that is displayed by

20       the browser **17** providing the individual options to the client. A preferred e-content client system **12** is shown in more detail in Figure **3**.

Optionally, client **12** submits the required user information to identify themselves as being authorized to access the requested information. User information can include

25       data such as a password or a combination of a user identification and password assigned by the server **11**.

Network **13** is the medium used to provide communications links between various devices and computers connected together within distributed data processing system

30       **10**. Network **13** may include permanent connections, such as wire or fiber optic

cables, or temporary connections made through telephone or wireless communications. Clients and servers may be represented by a variety of computing devices, such as mainframes, personal computers, personal digital assistants (PDAs), smart phones, etc. Distributed data processing system may include additional servers, clients, routers and other devices not shown. In the depicted example, the distributed data processing system **10** may include the Internet with network **13** representing a worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. Of course, the distributed data processing system may also include a number of different types of networks, such as, for example, an intranet, a local area network (LAN), or a wide area network (WAN).

The present invention could be implemented on a variety of hardware platforms and could be implemented in a variety of software environments. A typical operating system may be used to control program execution within the data processing system. Furthermore, although the preferred embodiment described below includes a "browser" at the client as the agent which exchanges data in the security protocols with the Web Application Server, the agent at the client does not have to be a conventional browser, e.g., Netscape Navigator® or Microsoft Internet Explorer®. In order to secure the information transmitted to and from the server, the client may be capable of Public Key Infrastructure (PKI) technology exchanged in a security protocol such as the Secure Sockets Layer (SSL) version 3.0 and above.

Web application server **11** includes a conventional server software program such as International Business Machines' Websphere® , for administering operation of the e-content server. The server software includes application programs that enable the server **11** to manage the e-content database, execute e-content access policies **16**, and maintain the accounting database **18**.

It should be recognized that the present invention may be implemented over communication systems that include fiber optics, wire or wireless technology, such as Wireless Application Protocol ("WAP") or Bluetooth based communication mechanisms, or combinations thereof.

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FIG. **2** depicts an example of a client-server system connected through the Internet **21**. In this example, a remote server system **22** is connected through the Internet to client system **20**. The client system **20** includes conventional components such as a processor **24**, memory **25** (e.g. RAM), a bus **26** which couples the processor **24** and

10　　memory **25**, a mass storage device **27** (e.g. a magnetic hard disk or an optical storage disk) coupled to the processor and memory through an I/O controller **28** and a network interface **29**, such as a conventional modem. The server system **22** also includes conventional components such as a processor **34**, memory **35** (e.g. RAM), a bus **36** which couples the processor **34** and memory **35**, a mass storage device **37** (e.g.

15　　a magnetic or optical disk) coupled to the processor **34** and memory **35** through an I/O controller **38** and a network interface **39**, such as a conventional modem. It will be appreciated from the description below that the present invention may be implemented in software that is stored as executable instructions on a computer readable medium on the client and server systems, such as mass storage devices **27**

20　　and **37** respectively, or in memories **25** and **35** respectively. The server system **22** is shown having the e-content database **14**, access polices **16**, and accounting database **18** stored in memory **35**. The server **22** is thus suitable for processing: (1) e-content access, (2) e-content transmission or checkout, (3) usage tracking, and (4) dynamic, usage-based pricing for accessing the e-content. The server **22** also preferably

25　　includes electronic mail software for processing e-mail messages and storing e-mail messages transmitted between the server and the various clients.

The server and systems shown in FIGS. **1** and **2** are suitable for distribution of e-content as well as dynamic accounting for usage of the e-content. A suitable usage

management system is disclosed in U.S. Patent Nos. 5,778,182 which is incorporated by reference herein. The methods and systems of the present invention for dynamic pricing of e-content and checkout extension will be discussed in more detail below.

5    FIG. 3 shows a client computer system 50 that can run a browser. The computer system 50 includes a display device 52 (such as a monitor), a display screen 54, a cabinet 56 (which encloses components typically found in a computer, such as CPU, RAM, ROM, video card, hard drive, sound card, serial ports, etc.), a keyboard 58, a mouse 60 and a modem or 62. Mouse 60 may have one or more buttons or control

10   devices, such as buttons 66. The computer requires some type of communication device such as modem 62 that allows computer system 50 to be connected to the Internet. Other possible communication devices include ethernet network cards.

FIG. 4 is a block diagram of one embodiment of a usage management system 110 in

15   accordance with the present invention. Usage management system 110 includes an e-content server 114. Optionally, the interactive server 114 comprises a server complex, wherein several servers interact to provide interactive services to subscribers/clients/users. Interactive server 114 includes a control server 111, which supervises the activities of server 114, and interfaces with usage management system

20   140 as will be explained in more detail hereinafter. Another server included in interactive television server 114 is a title or media server 116 that is configured to transmit desired applications or titles in response to demands made by the subscribers. Title server 116 functions as a communication manager and operates in conjunction with a database server 115, such as a Sybase database server. In response to a

25   subscriber's demand, title or media server 116 retrieves from database management server 115, a copy of the title or application demanded by the subscriber. Title or media server 116 then executes the retrieved copy of the demanded title or application and transmits the outcome to the subscriber's computer.

Interactive server **114** also includes an application programmer's interface **118** that generates records that contain information about specific actions or events that the usage management system **110** intends to track and store. In the present context, each event represents a group of predefined actions that are generated by a title, in response to a demand made by a subscriber. Events are predefined by the title developers and users of the management system **110**. Each of these events may include a plurality of domains that are being executed concurrently. Each domain defines at least one logical location in a title or an application whose contents may be provided to a subscriber. A logical location in a title may be the source of certain information or data being provided to a subscriber at a specific time. For example, this source of information may be a memory device or a file containing data related to items offered for sale in an interactive shopping session with a consumer. Another source of information may be the data corresponding to a prerecorded movie furnished by a title provider. The information model for tracking subscriber usage according to one embodiment of invention is based on usage of these logical locations or domains within a title. Thus each event record generated by the application programmer's interface contains information relating to one or more of these domains or logical locations. For example, when a subscriber accesses a desired title, the system generates an event record that contains domain data representing that title. This domain data is referred to as the title domain for the selected title. When the consumer accesses another location within that title, the system generates another event record that contains domain data indicating the usage of this other location. The usage management system 110, tracks the usage of each domain within consecutive event records.

The records generated by the application programmer's interface **118** have a predefined format. Application programmer's interface **118** allows the title providers to develop their titles, without knowing the exact format of event records that each title needs to generate. Application programmer's interface **118** generates records

based on a standardized format, relieving the application or title software from the task of formatting these records. However, it can be appreciated that the title providers may develop applications that can generate event records according to a predefined format, and therefore, the invention is not limited in scope to a system

5      including an application programmer's interface.

The output signals generated by interactive server **114** are coupled to an on-line teleprocessing gateway **120**, which functions as a gateway, for interactive television transactions, to entities external to interactive server **114**. These transactions may be

10     any application level data set or record that is to be transmitted from or received by the interactive server **114**. The on-line teleprocessing gateway **120** uses common industry communication standards to ensure data integrity. For example, in one embodiment of the invention, as illustrated in FIG. **4**, gateway **120** employs a communication protocol known as transmission control protocol/internet protocol

15     (TCP/IP) via TCP/IP standard sockets to send and receive information to the outside world. Gateway **120** communicates with interactive server **114** via an Ethernet network.

On-line teleprocessing gateway **120** uses a TCP client socket **122** to transmit

20     information to a usage processing system **140** via a communication network **124**. Communication network **124** provides access to the system by other remotely located administration servers. For example, subscriber service and billing server **126** is coupled to on-line teleprocessing gateway **120** to process a variety of administrative services. These services include channel mapping commands, intended for use by

25     interactive television server **114**, so as to provide the allocation of available channels to the subscribers. Other services include billing verification and subscription termination commands, when service to a subscriber terminates.

Usage processing system **140** uses a TCP server socket **148** to receive the usage event records from on-line teleprocessing gateway **120**. The usage processing system includes a usage scheduler **142** to transport usage event records from TCP server **148** to usage application servers **144**. In one embodiment of the invention, a plurality of

5      usage application servers **144** run at the same time to accommodate the incoming usage event records.

Usage application servers **144** interface with usage scheduler **142** to receive the usage event records generated by interactive server **114** via online teleprocessing gateway

10     **120**. Each usage application server **144** calculates the aggregate time of various interactive television usage domains spanning over a consecutive sequence of event records. Usage processing system **140** then records, in the usage processing database storage **146**, each occurrence of a usage domain and the corresponding time period that the usage domain remained active. As mentioned earlier, usage domain is defined

15     by each title as a specific logical area within the title for which title providers or e-content providers want to track usage. A domain may be a specific title, segment, activity or frame. Domains may also be defined to include groups of titles, such as shopping, or the whole interactive session.

20     Usage processing system **140** also includes a usage reporter that analyzes the data stored in database storage **146** and generates various usage reports. The report formats support the overall requirement for tracking subscriber usage and subscriber's navigational paths across the various titles. For example, certain reports depict usage by the number of times a particular title is accessed. Based on the usage occurrences

25     and subscriber navigation information, title providers can track subscribers' usage behavior over a period of time. The operation of each one of the components of the usage management system **110** is described in more detail hereinafter.

FIG. 5 illustrates the process for monitoring subscriber related activities that lead to the generation of usage event records. The e-content server 14, includes two types of applications known as the gopher application and all other title applications. The gopher application, which is a supervisor process to all title applications, is aware

5   when viewers are accessing e-content, for example by turning "on" and "off" a dedicated purpose device such as a television set top box or attempting to logon from a multipurpose computing device such as a personal computer. All usage events related to these activities are processed by the gopher application. All other usage related events are processed by the title applications.

10

As illustrated in FIG. 5, e-content server 114 initializes the gopher application at step 200. The system at step 202 waits for a signal from client device 20 of FIG. 2, indicating an activity intended to be processed by the gopher application. At step 204, if the gopher application receives such a signal, the system identifies the

15   corresponding event at step 206. Thereafter, the system goes to step 208 to call the application programmer's interface to generate an event record corresponding to the identified event. In the alternative, if at step 204, gopher application receives a signal not related to a gopher activity, the system goes to step 210 to determine whether the signal received from the client device corresponds to a title event that needs to be

20   tracked. If not, the system goes back to step 202 and monitors the signals generated by the client device 20 of FIG. 2.

If, however, an event to be tracked is identified at step 212, the title application calls the application programmer's interface to generate an event record corresponding to

25   the identified event. The title application sends function calls to the application programmer's interface to populate an event record with the data corresponding to logical locations or domains within the title that are being used by a particular subscriber.

Each event record according to one embodiment of the invention contains three data portions. The first portion is referred to as the Standard Record Elements. The second portion contains the event specific domains. The third portion contains the event specific data.

5

The Standard Record Elements portion contains all the housekeeping information about the subscriber and the time the event has been generated. More specifically the Standard Record Elements portion contains the following data elements:

10    1. AccountNo.: This element identifies the subscriber's account, which serves as a billing reference for a group of people at the same address;

2. OutletNo.: This element identifies an installation of a cable or set top box within a household. There may be several set top boxes within a household, each being used by a different user;

15    3. Dttm: This element refers to the date and the time when a specific event took place.

4. TitleDomain: This element refers to the specific title or application from which an event record is being generated.

5. NumberOfUsageDomains: This element refers to the number of usage domains that are present within the event record.

20    6. ConsumerId: This element is a unique identifier for a user of the set top box. This allows the system to track a plurality of users within the same household.

7. EventType: This element refers to the classification of actions or occurrences that take place while a consumer is utilizing a set top box.

8. PlaceId: This element is a unique identifier for a place within a domain. A place is

25    a logical area or a location in an interactive television title or application at a specific instant of time. This element is used to track the navigation of a consumer during a television session.

9. EntryMethod: This element is a code, which describes the method a subscriber chose to enter a logical place. For example "0" means that the consumer changed

channel by entering channel number on the remote control. "1" means that the subscriber chose a menu option with a control mouse device coupled to the set top box. "2" means that the subscriber chose menu option with a remote keypad.

5     When application programmer's interface **118** receives a function call from a title or application, it populates an event record with the corresponding data elements in order to generate an event record. In addition, application programmer's interface **118** populates the event record with standard record elements (SRE) described above. Each event record contains information for those domains used by a subscriber.

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TABLE 1

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Sign-On Event

Data Element Function Call

15

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Domain ID AddDomain( )

Title Domain ID SetTitleDomain( )

Consumer ID SetConsumerId( )

Place ID SetPlaceId( )

20    Entry Method Code SetEntryMethodCd( )

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For a Sign-On event, the AddDomain() function in Table 1 is executed by the gopher application. This function allows the addition of one or more domains that are desired

25    to be tracked. The SetTitleDomain() sets the domain id representing the title or channel the subscriber is currently tuned. Typically, this function is part of a start up routine of a title. The SetConsumerId() function is used to identify a subscriber. This function begins at the start of a title or at any time subscribers choose to identify themselves. The SetPlaceId() function sets the specific title-defined place that a

Subscriber is currently located within a domain. This function is used to track navigation within a title or between channels. Finally, the SetEntryMethodCd() function sets the entry method used by the subscriber as mentioned before This function is used to track navigational related data.

5

Table 2 illustrates the data elements and function calls related to the Sign Off Event. This event is recorded when a subscriber powers off the computing device. In one embodiment of the invention the Sign Off Event uses the same function calls as the Sign On Event.

10

TABLE 2

| Sign Off Event |
| --- |
| Date Element Function Call |

| Domain ID AddDomain( ) |
| --- |
| Title Domain ID SetTitleDomain( ) |
| Consumer ID SetConsumerId( ) |
| Place ID SetPlaceId( ) |
| Entry Method Code SetEntryMethodCd( ) |

15

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Therefore, once the subscriber signs off the system, the gopher application receives a signal indicating that a subscriber is signing off. It then generates the Sign Off Event record by executing the functions illustrated in table 2.

25

Table 3 illustrates the data elements and the corresponding function calls for generating a Usage Event record. The Usage Event record contains information relating to subscriber's usage of a particular domain in a title.

5    TABLE 3

_____

Usage Event

Data Element Function Call

_____

10    Domain ID AddDomain( )

Title Domain ID SetTitleDomain( )

Consumer ID SetConsumerId( )

Place ID SetPlaceId( )

Entry Method Code SetEntryMethodCd( )

15    _____


The usage event record tracks one or more domains within a title that need to be tracked. For example, one usage domain may be defined as a menu page of a home shopping title. Another usage domain may be one of the categories available from the
20    menu page of the home shopping title. A further usage domain may be a list of discounted items within that category. As a result, a first usage event may be defined by the menu page domain. A second usage event may be defined by a combination of menu page and category domains. Yet a third usage event may be defined by a combination of category domain and list of discounted items domain. It is thus
25    possible in accordance with one embodiment of the invention, to track usage events based on monitored domains. Conversely, it is also possible in accordance with another embodiment of the invention to track an active domain that may be present in a plurality of consecutive events. For the example of usage events mentioned above,

the category domain remains active in the second and third usage events. Thus, it is possible to track the duration of an active domain that spans consecutive events.

Table 4 illustrates the data elements and function calls relating to the Consumer Identification Event. This event is recorded when a subscriber needs to be identified. The data elements and function calls to generate this event is the same as those illustrated in tables 1-3.

TABLE 4

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Consumer Identification Event
Data Element Function Call

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Usage Domain AddDomain( )
Title Domain SetTitleDomain( )
Consumer ID SetConsumerId( )
PlaceID SetPlaceId( )
Entry Method Code SetEntryMethodCd( )

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According to one embodiment of the invention, the system generates other event records. For example, the system generates a View Feature Event record that relates to certain situations where a consumer invokes a special effect or function while viewing a video clip. Such special effects or functions may include fast forwarding, rewinding or pausing the video clip. For a View Feature Event (not shown), the system generates event specific data elements in addition to those illustrated in tables 1-4. These data elements are "View Id" and "Feature." The ViewId element identifies the function or special effects that are utilized by the subscribers while viewing a video clip. For example, the value FF refers to fast forward; RR refers to rewind; PA

refers to pause; FS refers to a full screen; PS refers to a partial screen; VA refers to the viewing angle. The Feature element identifies the domain that relates to a specific promotion, movie or product-related video clip the subscriber is viewing.

5     Another event record that the system generates is New Or Change Order Event. This record relates to a situation where a subscriber places an order or modifies an order for a product or service. Table 5 illustrates the data elements and function calls corresponding to this event record.

10     TABLE 5

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New Or Change Order Event

Data Element Function Call

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15     Usage Domain AddDomain( )

Title Domain SetTitleDomain( )

Consumer ID SetConsumerId( )

Place ID SetPlaceId( )

Entry Method Code SetEntryMethodCode( )

20     Payment Method

Number of Items Ordered

Total Tax Amount

Total Amount

Number of Points Gained/Used

25     Name of Person Shipped To

Information Provider ID

AddProduct( )

Product Number

Quantity

The AddProduct() function is used whenever a product or service has been purchased.

5     This function allows many products to be recorded within a single transaction.

As mentioned earlier, the data elements that are generated by a function call fill up the event specific data portion of the event records. By using the function calls stated above as one example of the present invention, application programming interface

10    **118** generates event records that contain information relating to the domains used by each subscriber in the system. When an event record is generated, application programming interface **118** sends the event record to the online teleprocessing gateway **120**.

15    FIG. **6** illustrates an embodiment of an online teleprocessing gateway **20**, in accordance with the invention, having various TCP client and server sockets. The online teleprocessing gateway **20** acts as an interactive transaction gateway. Each transaction is defined as any application level data set or record that needs to be transmitted between external entities and the server **114**. These external entities may

20    include a usage processing system **140**, customer service and billing processor **126** and information providers **130**. Sockets **124**, **131**, and **132** of the online teleprocessing gateway **120** are TCP Server sockets. Sockets **122**, **127** and **128** are TCP Client sockets. Customer service and billing server **126** sends administrative data to socket **124** of online teleprocessing gateway **120**. This information in turn is reformatted and

25    prepared for transmission to server **114**. Furthermore, socket **131** receives event records from server **114** and prepares the record for transmission to usage processing system **140** via TCP client socket **122**.

FIG. 7 is a flowchart illustrating the operation of online teleprocessing gateway **120**. At step **260**, the system enters initialization mode by calling initialization functions. The initialization functions are responsible for reading all the configuration files stored in connection with the operation of gateway **120**. These initialization functions

5    also initialize all the tables stored in gateway **120**. At step **262**, the system sets up multiple listening ports or sockets based on the number of external entities that intend to communicate with online teleprocessing gateway **120**. Typically there are one or two ports or sockets per entity. Each port is driven by a separate application server within the gateway **120**.

10

Gateway **120** functions as what is known in the art as a "server daemon." Server Daemons are well known in the art and defined in Unix Network Programming by W. Richard Stevens (Prentice Hall, 1990). Basically, a daemon is a process that executes in the background either waiting for some event to occur, or waiting to perform some

15   specified task on a periodic basis. Typically, in one embodiment of the invention, a daemon may be a UNIX process, which controls application-level data communications for a multi-media server such as media server **116**. The scope of the daemon extends to clients who can get connection to one of the mentioned servers and could have their transaction routed to a specific destination. Online teleprocessing

20   gateway **120** includes a dedicated management information base (MIB) that contains communications information on each entity coupled to online teleprocessing gateway **120**. A plurality of monitoring processes or hooks known as simple network management protocol (SNMP) use information contained in MIB to monitor the communication status of each connected entity. SNMP hooks are installed in a single

25   entity. It can be appreciated that multiple servers can also be used. This approach will lead to multiple MIBs and SNMP hooks in each server.

As mentioned, gateway **120** directs every transaction that it receives to a predetermined location. Therefore, at step **262**, gateway **120** also establishes client

connections to the destination server. These client connections are typically raw

socket based TCP/IP clients. Gateway **120** also sets up a Sybase open-client

connection to e-content server **114** via TCP client server socket **128**, for sending,

information that updates Sybase database **115** in server **114**.

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At step **264** the system enters a continuous loop waiting for the occurrence of events.

Gateway **120** polls all the TCP server sockets or ports. At step **266**, gateway **120**

determines whether an event has been sent by an outside entity. If so, at step **268** the

system determines whether the information received from the outside entity is valid.

10    This is to make sure that only authorized users are allowed access into gateway **120**.

At step **270** the system enters a service routine. It also goes back to step **264** to poll

sockets for incoming signals. Meanwhile, the server assigned to the port or socket that

has received an event record begins execution. At step **272** each server that is

prompted to act, identifies the type of event and the destination of the record.

15    Thereafter the servers establish a client connection with the intended destination at

step **274**.

FIG. **8** is a flowchart of a dynamic, usage-based pricing process **300** that would be

executed by the service and billing server **126** of FIG. **6**. In state **302**, the client **20**

20    attempts to access e-content through the server **114**. The server **114** then verifies, in

state **304**, that the client **20** is authorized to access the e-content in accordance with

the server access policies **16**. In state **306**, the server **114** determines whether the

client **20** attempting access is a first-time user, for example by determining whether

the user already has an account. If the user is determined to be a first-time user, then

25    any relevant incentives or offers are provided to the user in state **308**, followed by the

client **20** being allowed access to the e-content in state **310**.

If the server determines, in state **306**, that the user **20** is not a first-time user, such as

by locating an existing account for the client, then the server **114** determines whether

the client is authorized to access the e-content in state **312**. For example, authorization for the client to access the e-content may depend upon the client's account payment status, remaining promotional privileges, account restrictions, or client obedience of usage restrictions. If the client **20** is not authorized, then the client

5    is logged-out in state **314**. Conversely, if the client is determined to be authorized, then the server **114** allows the client to access the e-content in state **310**.

Following state **310**, the usage processing system **140** tracks one or more client usage characteristics in state **316**, preferably in accordance with the event records generated

10   by the application programmer interface **118** of FIG. **4**. The one or more client usage characteristics tracked in state **316** are then shared with the billing server **126** in state **318**. The billing server **126** then determines the appropriate client charges on the basis of the usage characteristics, in state **320**.

15   The determination of charges may involve any algorithm or rate schedule so long as the usage is one factor in the calculation. More particularly, the method may include charging the individual a price that is determined as a predetermined function of the one or more usage characteristics. Preferably, the usage is the primary or only variable in the determination of charges. For example, the algorithm may be a linear,

20   exponential, or other mathematical expression that is a function of client usage and produces a result that represents an amount of currency to be charged. Most preferably, the algorithm will be selected to encourage various aspects of usage, such as volume, frequency and type of e-content accessed, by providing reduced marginal charges for accessing the promoted e-content. It is even anticipated that the client

25   may receive rebates or credit for accessing e-content in the nature of advertising, informational commercials or shopping. The usage characteristics that are tracked may be any measurable characteristic, such as the number of titles accessed, time spent accessing or using the e-content, type or nature of e-content accessed, number of domains accessed or the amount of server processing or uploading time consumed.

FIG. **9** is a flowchart of an e-content checkout extension process **330** of the present invention. While the process is described as if executed by a usage tracker downloaded to the client computer along with the e-content, the process may just as easily be executed by a component of the e-content server where the e-content is viewable by the client but maintained on the server. Accordingly, a client **20** checks out, rents or otherwise accesses an e-content title available on the server **114** in state **332**, such checkout process presumably including a fee being charged to the client whether this is an original checkout or a renewal. After completing the e-content checkout or download to the client **20** in state **334**, state **336** provides that the usage tracker instructions that are downloaded along with the e-content will transmit usage messages or reports from the client **20** to the server **114** regarding one or more characteristic of the client's accessing of the e-content.

After the server has receiving a usage report in step **336**, the server **114** determines, in state **338**, whether the client **20** has paid for the access. If the client has not paid for access, then control is passed to state **340** where the server queries whether the client wants to pay for access to the e-content. If the client does want to pay for access, then control is passed to state **332** for checkout. However, if it is determined in state **338** that the client has in fact paid for access, then the server determines in state **342** whether the client is attempting to access the e-content within the checkout period before expiration. If the client has paid, then state **344** provides the client with access to the e-content. Conversely, if the client has previously paid for access as determined in state **338**, but the access period has expired as determined in state **342**, then the server queries whether the client wants to renew the e-content checkout in state **346**. If the client wants to renew, then control is passed back to state **332**, else the process exits in state **348**.

It will be understood from the foregoing description that various modifications and changes may be made in the preferred embodiment of the present invention without departing from its true spirit. It is intended that this description is for purposes of illustration only and should not be construed in a limiting sense. The scope of this

5     invention should be limited only by the language of the following claims.